Claims

What is claimed is:

1. A base station for providing flexible data rate transmission in a telecommunications system comprising:

an interface operable to receive an incoming data stream;

a signal processor coupled to the interface, the signal processor operable to:

receive the incoming data stream from the interface;

select an operating downlink chip rate from at least two chip rates;

select a spreading factor; and

spread the incoming data stream into a spread data stream with a channelization code; and

a transmitter coupled to the signal processor, the transmitter operable to receive the spread data stream from the signal processor and transmit the spread data stream over an air interface.

2. The base station of claim 1, wherein the at least two chip rates are 3.84 Mchips/second and 3.84 x (n/p) Mchips/second, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

3. The base station of claim 1, wherein the signal processor is further operable to:

segment the incoming data stream into one or more frames, each frame comprising one or more slots.

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4. The base station of claim 3, wherein the signal processor is further operable to:

select the operating downlink chip rate from the at least two chip rates, wherein the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

5. The base station of claim 4, wherein the signal processor is further operable to:

set the number of slots within the frame to 15, if n/p is equal to ½ or ¼;
set the number of slots within the frame to 10, if n/p is equal to 1/3; and
set the number of slots to 12, if n/p is equal to 1/5 or 2/5.

6. The base station of claim 5, wherein the signal processor is further operable to:

select the spreading factor based on a quality of service, q, and the operating chip rate.

7. The base station of claim 1, wherein the signal processor is further operable to:

where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (7-i+n-1), select the spreading factor, SF^R, as $SF^R = n \times \frac{512}{2^{q+i}}$.

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8. The base station of claim 7, wherein the signal processor is further operable to:

select a number of slots, N_S^R, as:

if p=2^i, $N_S^R = N_S$,

if p=2^i+1, $N_S^R = N_S \times \frac{2^i}{p}$.

9. The base station of claim 4, wherein the signal processor is further operable to:

select the spreading factor, SF^R, as:

if n/p = ½ or 1/4 , $SF^R = \frac{512}{2^{q+1}}$,

if n/p=1/3, 1/5, or 2/5, $SF^R = n \times \frac{512}{2^{q+2}}$.

10. The base station of claim 1, wherein the signal processor is further operable to generate a synchronization signal at the selected operating downlink chip rate, and the transmitter is further operable to transmit the synchronization signal.

11. The base station of claim 1, further comprising:

a receiver coupled to the signal processor, the receiver operable to receive a second spread data stream from the air interface which has been transmitted at an operating uplink chip rate selected from one of the at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

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12. A method of providing flexible data rate transmission in a telecommunication system, comprising:

receiving an incoming data stream;

selecting an operating chip rate from at least two chip rates;

selecting a spreading factor; and

spreading the incoming data stream into a spread data stream with a channelization code.

13. The method of claim 12, further comprising:

segmenting the incoming data stream into one or more frames, each frame comprising one or more slots.

14. The method of claim 13, wherein the stage of selecting further comprises:

selecting the operating downlink chip rate from at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

15. The method of claim 14, further comprising:

setting the number of slots within the frame to 15, if n/p is equal to ½ or ¼;

setting the number of slots within the frame to 10, if n/p is equal to 1/3; and

setting the number of slots to 12, if n/p is equal to 1/5 or 2/5.

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16. The method of claim 15, wherein selecting the spreading factor further comprises:

selecting the spreading factor based on a quality of service, q, and the operating chip rate.

17. The method of claim 12, wherein selecting the spreading factor further comprises:

where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (7-i+n-1), selecting the spreading factor, SF^R, as $SF^R = n \times \frac{512}{2^{q+i}}$.

18. The method of 17, further comprising selecting a number of slots, N_S^R, as:

if p=2^i, $N_S^R = N_S$,

if p=2^i +1, $N_S^R = N_S \times \frac{2^i}{p}$.

19. The method of claim 14, wherein selecting the spreading factor further comprises:

setting the spreading factor, SF^R, to:

if n/p = ½ or 1/4 , $SF^R = \frac{512}{2^{q+1}}$, or

if n/p=1/3, 1/5, or 2/5, $SF^R = n \times \frac{512}{2^{q+2}}$.

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20. The method of claim 12, further comprising:

generating a synchronization signal at the selected operating downlink chip rate and transmitting the synchronization signal.

21. The method of spreading an incoming data stream of claim 12, further comprising:

receiving a second spread data stream from an air interface which has been transmitted at an operating uplink chip rate selected from one of the at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

22. A user equipment for providing flexible data rate transmission in a telecommunications system comprising:

an interface operable to receive an incoming data stream;

a signal processor coupled to the interface, the signal processor operable to:

receive the incoming data stream from the interface;

select an operating uplink chip rate from at least two chip rates;

select a spreading factor; and

spread the incoming data stream into a spread data stream with a channelization code; and

a transmitter coupled to the signal processor, the transmitter operable to receive the spread data stream from the signal processor and transmit the spread data stream over an air interface.

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23. The user equipment of claim 22, wherein the at least two chip rates are 3.84 Mchips/second and 3.84 x (n/p) Mchips/second, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

24. The user equipment of claim 22, wherein the signal processor is further operable to:

segment the incoming data stream into one or more frames, each frame comprising one or more slots.

25. The user equipment of claim 24, wherein the signal processor is further operable to:

select an operating uplink chip rate from at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

26. The user equipment of claim 25, wherein the signal processor is further operable to:

set the number of slots within the frame to 15, if n/p is equal to ½ or ¼;
set the number of slots within the frame to 10, if n/p is equal to 1/3; and
set the number of slots to 12, if n/p is equal to 1/5 or 2/5.

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27. The user equipment of claim 26, wherein the controller is further operable to:

select the spreading factor based on a quality of service, q, and the operating chip rate.

28. The user equipment of claim 22, wherein the signal processor is further operable to:

where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (6-i+n-1), select the spreading factor, SF^R, as $SF^R = n \times \frac{256}{2^{q+i}}$.

29. The user equipment of claim 22, further comprising:

a receiver coupled to the signal processor, the receiver operable to receive a second spread data stream from the air interface which has been transmitted at an operating uplink chip rate selected from one of the at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

30. A computer-readable medium having executable instructions for performing steps that provide flexible data rate transmission in a telecommunication system, the steps comprising:

receiving an incoming data stream;

selecting an operating chip rate from at least two chip rates;

selecting a spreading factor; and

spreading the incoming data stream into a spread data stream with a channelization code.

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31. The computer-readable medium of claim 30 having further executable instructions for:

segmenting the incoming data stream into one or more frames, each frame comprising one or more slots.

32. The computer-readable medium of claim 32 having further executable instructions for:

selecting the operating downlink chip rate from at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

33. The computer-readable medium of claim 32 having further executable instructions for:

setting the number of slots within the frame to 15, if n/p is equal to ½ or ¼;

setting the number of slots within the frame to 10, if n/p is equal to 1/3; and

setting the number of slots to 12, if n/p is equal to 1/5 or 2/5.

34. The computer-readable medium of claim 33 having further executable instructions for:

selecting the spreading factor based on a quality of service, q, and the operating chip rate.

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35. The computer-readable medium of claim 30 having further executable instructions for:

where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (7-i+n-1), selecting the spreading factor, SF^R, as $SF^R = n \times \frac{512}{2^{q+i}}$.

36. The computer-readable medium of claim 35 having further executable instructions for:

selecting a number of slots, N_S^R, as:

if p=2^1, $N_S^R = N_S$,

if p=2^i +1, $N_S^R = N_S \times \frac{2^i}{p}$.

37. The computer-readable medium of claim 32 having further executable instructions for:

setting the spreading factor, SF^R, to:

if n/p = ½ or 1/4, $SF^R = \frac{512}{2^{q+1}}$, or

if n/p=1/3, 1/5, or 2/5, $SF^R = n \times \frac{512}{2^{q+2}}$.

38. The computer-readable medium of claim 30 having further executable instructions for:

transmitting a synchronization channel at the selected downlink chip rate.

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39. The computer-readable medium of claim 30 having further executable instructions for:

receiving a second spread data stream from an air interface which has been transmitted at an operating uplink chip rate selected from one of the at least two chip rates, wherein the first of the chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

40. A signal processor for providing flexible data rate transmission in a telecommunications system comprising:

an input operable to receive an incoming data stream;

a processor coupled to the input, the processor operable to:

receive the incoming data stream from the input;

select an operating downlink chip rate from at least two chip rates;

select a spreading factor; and

spread the incoming data stream into a spread data stream with a channelization code; and

an output coupled to the processor, the output operable to receive the spread data stream from the processor.

41. The signal processor station of claim 40, wherein the at least two chip rates are 3.84 Mchips/second and 3.84 x (n/p) Mchips/second, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

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42. The signal processor of claim 40, wherein the processor is further operable to:

segment the incoming data stream into one or more frames, each frame comprising one or more slots.

43. The signal processor of claim 42, wherein the processor is further operable to:

select the operating downlink chip rate from the at least two chip rates, wherein the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, where n/p is selected from ½, 2/5, 1/3, ¼, and 1/5.

44. The signal processor of claim 43, wherein the processor is further operable to:

set the number of slots within the frame to 15, if n/p is equal to ½ or ¼;
set the number of slots within the frame to 10, if n/p is equal to 1/3; and
set the number of slots to 12, if n/p is equal to 1/5 or 2/5.

45. The signal processor of claim 44, wherein the processor is further operable to:

select the spreading factor based on a quality of service, q, and the operating chip rate.

46. The signal processor of claim 40, wherein the processor is further operable to:

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where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (7-i+n-1), select the spreading factor, SF^R, as $SF^R = n \times \frac{512}{2^{q+i}}$.

47. The signal processor of claim 46, wherein the processor is further operable to:

select a number of slots, N_S^R, as:

if $p=2^i$, $N_S^R = N_S$,

if $p=2^i+1$, $N_S^R = N_S \times \frac{2^i}{p}$.

48. The signal processor of claim 43, wherein the processor is further operable to:

select the spreading factor, SF^R, as:

if n/p = ½ or 1/4 , $SF^R = \frac{512}{2^{q+1}}$,

if n/p=1/3, 1/5, or 2/5, $SF^R = n \times \frac{512}{2^{q+2}}$.

49. The signal processor of claim 40, wherein the processor is further operable to generate a synchronization signal at the selected operating downlink chip rate.

50. The signal processor of claim 40, wherein the processor is further operable to:

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where the first of the two chip rates is equal to a fraction, n/p, of the second of the chip rates, and where i = 1 to 2, n= 1 to i, and q= 0 to (6-i+n-1), select the spreading factor, SF^R, as $SF^R = n \times \frac{256}{2^{q+i}}$.

51. The signal processor of claim 50, wherein the processor is further operable to:

select a number of slots, N_S^R, as:

if p=2^i, $N_S^R = N_S$,

if p=2^i +1, $N_S^R = N_S \times \frac{2^i}{p}$.

52. The signal processor of claim 43, wherein the processor is further operable to:

select the spreading factor, SF^R, as:

if n/p = ½ or 1/4 , $SF^R = \frac{256}{2^{q+1}}$,

if n/p=1/3, 1/5, or 2/5, $SF^R = n \times \frac{256}{2^{q+2}}$.

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